Fluxes over snow and snow melt in the North Park Basin

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GOALS

The flux measurements will focus on water vapor flux from the snow surface due to snow melt and sublimation.

Improved 3-component hot film anemometer will be deployed to correct for eddy correlation flux loss in very stable conditions over snow surfaces.

Improvement of existing models will focus on:

1. Fluxes patchy snow conditions

2. Semi-collapsed turbulence due to warm air advection or strong nocturnal cooling

3. Sublimation.

FIRST YEAR FIELD WORK

1 Dec. 2001 – 1 April 2002

Intensive periods:

1 –15 Dec.
15 –28 Feb
20-30 March

MAIN SYSTEMS

5 Micronet stations

a) 2-D Handar sonic anemometers measure wind speeds down to a few cm/s.

b) RM aspirated shield and RTD probe

Main tower

Multiple levels of heat, moisture and momentum flux

Wind and temperature profiles

Snow surface energy budget

Mini tower

The mini tower will be placed 10+ m from the main tower.

a) A rotating hot film anemometer will be implemented at 0.5 m.

b) A fixed hot film and CSAT will be implemented at 1 m in a fixed direction.

c) LiCor for moisture fluxes

Roving system

Human traverses with backpack, including GPS system and Vaisalla temperature probe.

Snow-Measurement Plans for North Park Flux-Tower Site

Objective:

To map the snow-distribution evolution over the area upwind of the flux tower.

Tools:

MagnaProbe (developed by Matthew Sturm, CRREL)
Differential GPS (~ 1-m accuracy)

Sampling Procedure:

Winter measurements:

Snow-depth measurement approximately every 10-m, in x and y
- x, y position recorded
- produces about 2100 data points
- requires 21-km of skiing
- to be done in one day
- measurements made once per month (Dec, Jan, Feb, Mar)

Spring (melt-period) measurements:

Snow-patch boundary measurements
- use continuous-recording GPS
- ski/walk patch boundaries
- measurements made once per week, as needed (Mar, Apr)